

III. REMARKS

In the Office Action, claims 1, 3, 8, 10-12, 14-16 and 18 were rejected under 35 U.S.C. 103 as being unpatentable over Chong (US 6,590,946), in view of Rothweiler (US 5649051) and Li (IEEE publication, from IDS, namely, "Analysis-by-Synthesis Multimode Harmonic Speech Coding at 4 KB/S") for reasons set forth in the Action. Claims 2, 9, 13 and 17 were rejected under 35 U.S.C. 103 as being unpatentable over Chong in view of Rothweiler, Li and Manjunath (US 6,456,964); Claim 5 were rejected under 35 U.S.C. 103 as being unpatentable over Chong in view of Rothweiler, Li, Manjunath and Kleijn (US 6,223,151); Claim 7 was rejected under 35 U.S.C. 103 as being unpatentable over Chong in view of Rothweiler, Li, Manjunath, Kleijn (US 6,223,151) and Kleijn (US 5517595); and Claim 6 was rejected under 35 U.S.C. 103 as being unpatentable over Chong in view of Rothweiler, Li, Manjunath, and Donovan (US 6,266,637) for reasons set forth in the Action.

With respect to the rejections under 35 U.S.C. 103, various ones of the claims are amended and the following argument is presented to distinguish the claimed subject matter from the teachings of the cited art, considered individually and in combination, thereby to overcome the rejections and to show the presence of allowable subject matter in the claims.

All of the independent claims 1, 8, 12 and 15 were rejected upon the combination of the three references Chong in view of Rothweiler and Li. With respect to Rothweiler, Rothweiler discloses a speech encoding and decoding device. The examiner has pointed out (col. 10 at lines 22-35) where pitch intervals periods are averaged in order to achieve an averaged pitch value. Furthermore, there is a pitch epoch detector which determines length of each pitch period in the input speech signal. Also, a periodicity analysis block estimates pitch jitter by computing the standard deviation of the pitch periods.

In this response, the independent claims are amended to provide further detail in the use of the pitch pulse locations for determination of an average pitch pulse period, and

to show that, in the modifying of the formulated signal to provide equally spaced pitch pulses, there is a removal of jitter from the formulated signal for a more accurate determination of a voicing parameter used in a subsequent decision (selection) of encoding method.

It is believed that this amendment distinguishes the claimed subject matter over the combined teachings of Chong, Rothweiler, and Li by defining the averaging of the pitch period more accurately, together with a linking of the jitter removal to attain a more accurate determination of the voicing parameter. It appears that this feature of the claimed subject matter is not taught or suggested in any of the cited art, and that therefore, this amendment should overcome the grounds of rejection to provide for allowable subject matter in the claims.

In the combination of the teachings of Chong with Rothweiler and Li, the examiner notes that Chong does not specifically disclose the step of determining an average pitch period using the location of at least one pitch pulse followed by a determination of a voicing parameter based on the modified signal. However, the examiner notes that Rothweiler teaches a step of determining an average pitch period using the location of a pitch pulse. The examiner relies on Li to teach the step of determining a voicing parameter based on the modified signal.

However, as has been noted in the argument of the previous response, Li discloses a speech codec which has a multi-mode functionality. Either the residual or the actual speech signal is directed to a pitch estimation module. This block at first pre-classifies the input speech into two different categories of speech, the first category including unvoiced speech and silence, and the second category including voiced speech and transition speech. For the first category, pitch candidates are generated by autocorrelation. The second category of speech is further classified and the final pitch is determined based on the pitch candidates. The signal is also modified based on the residual signal. Finally, the pitch is further refined, and harmonic bandwidth is

estimated. The signal modification is formed similarly as disclosed in a further referred document [9] "TIA/EIA/IS 127, Enhanced Variable Rate Codec (EVRC), in TIA Draft Standard, 1996". The EVRC uses a generalized Code Excited Linear Prediction algorithm, which further matches a time warped version of the original residual that conforms to a simplified pitch contour. In other words, the EVRC modifies the residual signal by shifting the pitch pulses for matching a target residual signal. In Li, it appears that the encoding mode is set according to the voicing classification, this being a different procedure than the pitch pulse shifting of the present claims.

Furthermore, this appears to be a different procedure from what is taught in Rothweiler. The two references, Rothweiler and Li, cannot be combined with Chong if Rothweiler and Li are presenting contradictory modes of evaluating pitch. Instead of motivating one to combine these references, the differing teachings of Rothweiler and Li would confuse someone as to the proper path to travel and direct a person away from an attempted combination of the references.

Also, as has been noted in the previous response, there is discussion of the matter of whether Li teaches, by citing the signal modification block in Fig. 3, the step of determining at least one voicing parameter based on the modified signal, the voicing parameter being either voiced or unvoiced. However, as noted in the argument of the previous response, the Li diagram actually shows that the signal which is to be modified is the residual signal $r(n)$, namely, the output of the analysis filter. This modified residual signal $r'(n)$ is then used as an input to the V/UV Model Parameter Estimator. This contradicts the presently claimed subject matter which calls for a "modifying the formulated signal using said average pitch period" followed by "determining said at least one voicing parameter based on the modified signal" (present claim 1, with corresponding language in other ones of the independent claims).

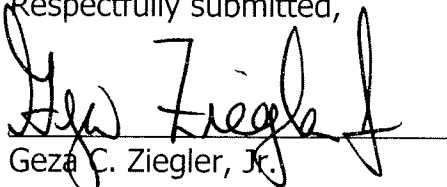
Accordingly, it is urged that the attempted combination of the foregoing teachings of Chong, Rothweiler and LI would not lead to the practice of the present invention as set

forth in the present independent claims, as amended, as well as to their respective dependent claims. Therefore, it is urged that the foregoing amendment and argument have overcome the rejections to provide allowable subject matter in the claims.

For all of the foregoing reasons, it is respectfully submitted that all of the claims now present in the application are clearly novel and patentable over the prior art of record, and are in proper form for allowance. Accordingly, favorable reconsideration and allowance is respectfully requested. Should any unresolved issues remain, the Examiner is invited to call Applicants' attorney at the telephone number indicated below.

The Commissioner is hereby authorized to charge payment for any fees associated with this communication or credit any over payment to Deposit Account No. 16-1350.

Respectfully submitted,


Geza C. Ziegler, Jr.
Reg. No. 44,004

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Date

Perman & Green, LLP
425 Post Road
Fairfield, CT 06824
(203) 259-1800
Customer No.: 2512